



NVIDIA® QUADRO®

Leadtek Professional Graphic Cards

Quadro 3 year warranty
Free Online Technical Support



NVIDIA® QUADRO®
AUTHORISED PARTNER



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NVIDIA QUADRO® Professional Solutions

REAL INTERACTIVE EXPRESSION

Quadro® M6000

- 12GB/24GB 385-bit GDDR5
- NVIDIA GM200 GPU
- 3072 CUDA Cores
- GPU Core Clock 988 MHz/Memory Clock 3300 MHz
- Microsoft DirectX 12 Shader Model 5.0
- Support one Dual-Link DVI-I, quad Display-Port 1.2, and optional Stereo connectors
- Physical Dimension: 4.4" H x 10.5" L, Dual Slot, Full Height
- Maximum Power Consumption: 250W
- Maximum Resolution: 4096x2160 at 60Hz
- CUDA, PCI-E Gen 3.0, PCI-E x16



Quadro® M5000

- 8GB 256-bit GDDR5
- NVIDIA GM204 GPU
- 2048 CUDA Cores
- GPU Core Clock 861 MHz/Memory Clock 3305 MHz
- Microsoft DirectX 12 Shader Model 5.0
- Support one Dual-Link DVI-I, quad Display-Port 1.2 and optional Stereo connectors
- Physical Dimension: 4.4" H x 10.5" L, Dual Slot, Full Height
- Maximum Power Consumption: 150W
- Maximum Resolution: 4096x2160 at 60Hz
- CUDA, PCI-E Gen 3.0, PCI-E x16



Quadro® M4000

- 8GB 256-bit GDDR5
- NVIDIA GM204 GPU
- 1664 CUDA Cores
- GPU Core Clock 773 MHz/Memory Clock 3005 MHz
- Microsoft DirectX 12 Shader Model 5.0
- Support quad Display-Port 1.2, and optional Stereo connectors
- Physical Dimension: 4.4" H x 9.5" L, Single Slot, Full Height
- Maximum Power Consumption: 120W
- Maximum Resolution: 4096x2160 at 60Hz
- CUDA, PCI-E Gen 3.0, PCI-E x16



Quadro® M2000

- 4GB 128-bit GDDR5
- NVIDIA GM206 GPU
- 768 CUDA Cores
- GPU Core Clock 1163 MHz/Memory Clock 3303 MHz
- Microsoft DirectX 12 Shader Model 5.0
- Support quad Display-Port 1.2 connectors
- Physical Dimension: 4.376" H x 6.6" L, Single Slot, Full Height
- Maximum Power Consumption: 75W
- Maximum Resolution: 4096x2160 at 60Hz
- CUDA, PCI-E Gen 3.0, PCI-E x16



Quadro® K1200

- 4GB 128-bit GDDR5
- NVIDIA GM107 GPU
- 512 CUDA Cores
- GPU Core Clock 1033 MHz/Memory Clock 2505 MHz
- Microsoft DirectX12 Shader Model 5.0
- Support quad mini-DisplayPort 1.2 connectors
- Physical Dimension: 2.71" H x 6.6875" L, Single slot, Low Profile
- Maximum Power Consumption: 46W
- Maximum Resolution: 3840x2160 at 60Hz
- CUDA, PCI-E Gen 2.0, PCI-E x16



Quadro® K620

- 2GB 128-bit DDR3
- NVIDIA GM107 GPU
- 384 CUDA Cores
- GPU Core Clock 1059 MHz/Memory Clock 900 MHz
- Microsoft DirectX 12 Shader Model 5.0
- Support one Dual-Link DVI-I, and one Display-Port 1.2 connectors
- Physical Dimension: 2.713" H x 6.3" L, Single slot, Low Profile
- Maximum Power Consumption: 41W
- Maximum Resolution: 3840x2160 at 60Hz
- CUDA, PCI-E Gen 2.0, PCI-E x16



Quadro® K420

- 1GB/2GB 128-bit DDR3
- NVIDIA GK107 GPU
- 192 CUDA Cores
- GPU Core Clock 875 MHz/Memory Clock 891 MHz
- Microsoft DirectX 12 Shader Model 5.0
- Support one Dual-Link DVI-I, and one Display-Port 1.2 connectors
- Physical Dimension: 2.713" H x 6.3" L, Single slot, Low Profile
- Maximum Power Consumption: 41W
- Maximum Resolution: 3840x2160 at 60Hz
- CUDA, PCI-E Gen 2.0, PCI-E x16



QUADRO® NVS SERIES

BRILLIANTLY SIMPLY DIGITAL SIGNAGE

Quadro® NVS810

- Maximum Display per Board: 8
- 4GB 128-bit DDR3 (2GB per GPU)
- 1024 CUDA Cores (512 per GPU)
- Support eight mini-DisplayPort(mDP) connectors
- Physical Dimensions: 4.4" H x 7.8" L, Single Slot
- Form Factor: Full Height
- Maximum Power Consumption: 68W
- Maximum Digital Display Support: 8x 4096x2160@30Hz, 4x 4096x2160@60Hz



Quadro® NVS510

- Maximum Displays per Board: 4
- 2GB 128-bit DDR3
- 192 CUDA Cores
- Support quad mini-DisplayPort(mDP) connectors
- Physical Dimensions: 2.713" H x 6.3" L, Single Slot
- Form Factor: Low Profile
- Maximum Power Consumption: 33.4W
- Maximum Digital Display Support: 3840 X 2160



Quadro® NVS315

- Maximum Displays per board: 2
- 1GB 64-bit DDR3
- 48 CUDA cores
- Support one DMS-59 connector
- Physical Dimensions: 2.713" H x 5.7" L, Single Slot
- Form Factor: Low Profile
- Maximum Power Consumption: 19.3W
- Maximum Digital Display Support: 2560x1600



Quadro® NVS310

- Maximum Displays per board: 2
- 512MB/1GB 64-bit DDR3
- 48 CUDA cores
- Supports dual Display-Port 1.2 connector
- Physical Dimensions: 2.7" H x 5.7" L, Single Slot
- Form Factor: Low Profile
- Maximum Power Consumption: 19.5W
- Maximum Digital Display Support: 2560X1600



NVIDIA Tesla GPU Accelerators

Accelerate your most demanding HPC, hyperscale, and enterprise data center workloads with NVIDIA Tesla® GPU accelerators.

Scientists can now crunch through petabytes of data up to 10x faster than with CPUs in applications ranging from energy exploration to machine learning. Plus, Tesla accelerators deliver the horsepower needed to run bigger simulations faster than ever before. For enterprises deploying VDI, Tesla accelerators are perfect for accelerating virtual desktops to any user, anywhere.

Accelerating Your Data Center with the Right Tesla GPU

High-Performance Computing (HPC)

Designed for the Most Demanding Computational Tasks

Tesla K40

- 12GB 384-bit GDDR5
- 2880 CUDA cores
- Peak Double Precision Floating Point Performance: 1.43 Tflops
- Peak Single Precision Floating Point Performance: 4.29 Tflops
- Thermal Cooling solution: Active or Passive heat sink
- Physical Dimension: 4.376" H x10.5" L, Dual Slot, Full Height
- Maximum Power Consumption: 235W



Tesla K80

- 24GB 384-bit GDDR5 (12GB per GPU)
- 4992 CUDA cores (2496 per GPU)
- Peak Double Precision Floating Point Performance: 2.91 Tflops
- Peak Single Precision Floating Point Performance: 8.74 Tflops
- Thermal Cooling solution: Passive heat sink
- Physical Dimension: 111.15 mm H x 267 mm L, Dual Slot, Full Height
- Maximum Power Consumption: 300W



Hyperscale

The World's Fastest Deep Learning Training Accelerator

Tesla M40

- 12GB/24GB 384-bit GDDR5
- 3072 CUDA cores
- Thermal Cooling solution: Passive heat sink
- Physical Dimensions: 111.15 mm H x 267 mm L, Dual Slot, Full Height
- Maximum Power Consumption: 250W



Enterprise Virtualization

Designed Specifically for Data Centers that are Virtualizing Desktop Graphics

Tesla M60

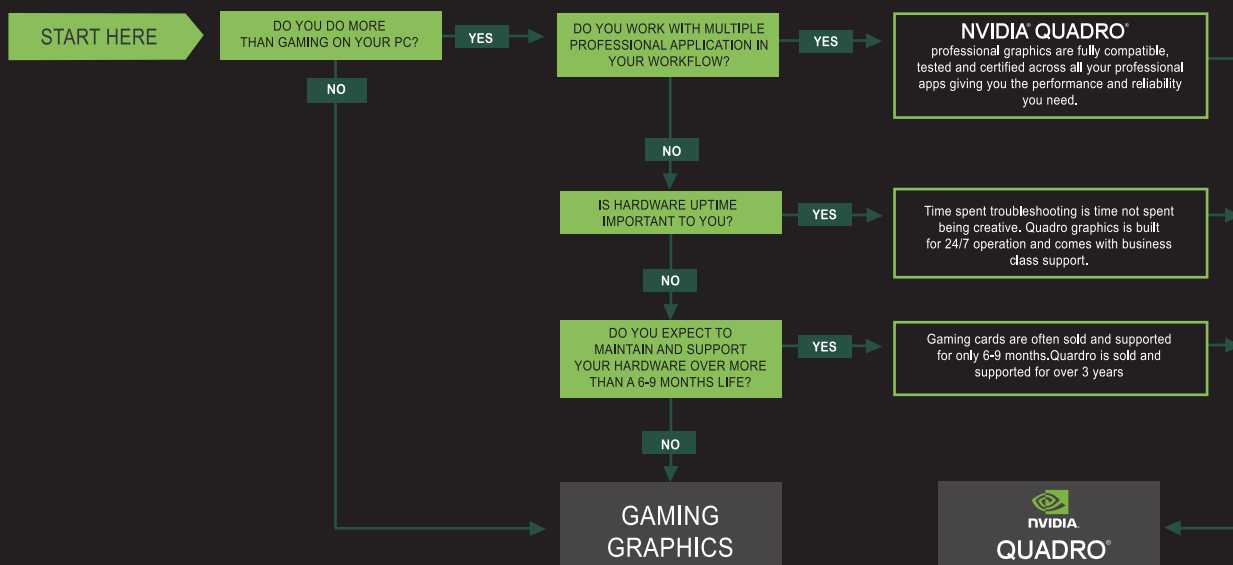
- 16GB 256-bit GDDR5 (8GB per GPU)
- 4096 CUDA cores (2048 per GPU)
- Thermal Cooling solution: Active or Passive heat sink
- Board Size: 111.15 mm H x 266.7 mm L, Dual Slot, Full Height
- Maximum Power Consumption: 300W



PROFESSIONAL GRAPHICS vs GAMING GRAPHICS



WHAT TYPE OF GRAPHICS SHOULD I BUY?
PRO OR GAMING?



BENEFITS OF PROFESSIONAL GRAPHICS OVER GAMING GRAPHICS

Quadro hardware is built for years of non-stop use

- > Quadro cards are built for use 24 hours a day, 7 day a week
- > Extended availability and support is offered on all professional cards, including bug fixes for professional applications

Quadro boards are built for workplace environments

- > Quadro cards have more memory, smaller footprints and consume less power
- > Deployment can be for tens or hundreds of PCs in offices
- > Application certified: Quadro cards and drivers are tested to work flawlessly on 100% of certified professional software applications.

Quadro boards come with professional management tools, like:

- > NVIDIA nView for desktop management, allowing users to create grids and snap applications to them
- > NVIDIA Mosaic for combining multiple displays into one large display seamlessly without tearing
- > Advanced 3D stereo supports stereoscopic 3D display on HDMI 3D TVs, projectors and displays allowing for viewing images and ultrasounds in 3D

TOP PROFESSIONAL APPLICATIONS CERTIFIED WITH NVIDIA QUADRO GRAPHICS CARDS¹

Manufacturing, Design and Engineering

- > ANSYS [Mechanical Fludent]
- > Autodesk [AutoCAD, 3ds Max, Inventor, Maya, Revit]
- > Bunkspeed / 3D Excite
- > Dassault Systemes [CATIA, SOLIDWORKS, SIMULIA]

Media and Entertainment

- > Adobe [After Effects, Illustrator, Premiere Pro, Photoshop]
- > Maxon CINEMA 4D
- > RTT [DeltaGen, DeltaView]

¹ For a more extensive list of applications, see the Quadro Section within the NVIDIA Professional Solution Sales Toolkit, www.brainshark.com/nvidia/psg-sales-toolkit.

PROFESSIONAL GRAPHICS vs ALTERNATIVE GRAPHICS COMPARISON

		QUADRO	GAMING	INTERGATED
Performance	Application specific feature development and tuning	✓	✗	✗
	Driver optimizations to maximize GPU features	✓	✗	✗
	Unique features to support pro workflows	✓	✗	✗
	IT tools for easy deployment & management	✓	✗	✗
	Game developer support with Gaming Profile	✓	✗	✗
	Extreme performance scaling with Multi-GPU	✓	✗	✗
Reliability	Application specific testing by NVIDIA	✓	✗	✗
	100+ professional application certifications by ISVs	✓	✗	✗
	Certified across workstation paltforms by leading OEMs	✓	✗	✗
	Unified rock-solid driver with deterministic release schedule	✓	✗	✗
	Designed and built by NVIDIA to a single specification for 24x7 reliability & stability	✓	✗	✗
	Extended availability and 3 year warranty	✓	✗	✗
Support	Deep workflow experience across vertical industries	✓	✗	✗
	Long-Life Cycle availability and support	✓	✗	✗
	Bulk availability for large Enterprises	✓	✗	✗
	Global technical pre-sales and post-sales support	✓	✗	✗
	Online end-user forums for fast support from SMEs	✓	✗	✗

WHICH QUADRO SOLUTION IS RIGHT FOR YOUR CUSTOMER?

RECOMMENDED NVIDIA PROFESSIONAL SOLUTION			
ASK	WHAT APPLICATION DO YOU USE?	GOOD	BETTER
		> Occasional use of application > Small objects and assemblies > About 10% of the users	> Regular use of application > Average to large objects and assemblies > Using all application features > About 80% of the users
			BEST
		> Pushing the application to its limits > Extremely large objects and assemblies > Using all application features > About 10% of the users	
DESIGN / ENGINEERING / MANUFACTURING			
Altair® HyperWork®	NVIDIA® Quadro® M2000	Quadro M4000	Quadro M5000
ANSYS Mechanical™	Multi-GPU Quadro M2000 + Tesla K40	Multi-GPU Quadro M5000 + Tesla K40	Multi-GPU Quadro K6000 + Tesla K40
ANSYS Fluent®	Multi-GPU Quadro M2000 + Tesla K40	Multi-GPU Quadro M5000 + Tesla K40	Multi-GPU Quadro K6000 + Tesla K40
AutoCAD® Design Suite (AutoCad + Showcase + 3Ds Max)	Quadro M2000	Quadro M5000	Multi-GPU Quadro M5000 + Tesla K40
Autodesk® AutoCAD®	Quadro K620	Quadro M2000	Quadro M4000
Product Design Suite (Inventor + Showcase + 3Ds Max)	Quadro M2000	Quadro M5000	Multi-GPU Quadro M5000 + Tesla K40
Autodesk Inventor®	Quadro M2000	Quadro M4000	Quadro M5000
Autodesk MoldFlow®	Multi-GPU Quadro K620 + Tesla K40	Multi-GPU Quadro M2000 + Tesla K40	Multi-GPU Quadro M4000+ Tesla K40
Building Design Suite	Quadro M2000	Quadro M4000	Quadro M5000
Autodesk Revit®	Quadro K620	Quadro M2000	Quadro M4000
Autodesk Showcase®	Quadro M2000	Quadro M4000	Quadro M5000
Autodesk Inventor + 3ds Max®	Quadro M2000	Quadro M5000	Multi-GPU Quadro M5000 + Tesla K40
Autodesk Revit + 3ds Max	Quadro M2000	Quadro M5000	Multi-GPU Quadro M5000 + Tesla K40
Dassault Systèmes 3DEXCITE DELTAGEN/DELTAVIEW	Quadro M4000	Quadro M5000	Quadro M6000 24GB
Dassault Systèmes SIMULIA Abaqus¹	Multi-GPU Quadro M2000 + Tesla K40	Multi-GPU Quadro M4000+ Tesla K40	Multi-GPU Quadro M5000 + Tesla K40
Dassault Systèmes CATIA V5 and V6	Quadro M2000	Quadro M4000	Quadro M5000
Dassault Systèmes CATIA Live Rendering	Quadro M5000	Quadro M6000 24GB	Multi-GPU 2x Quadro M6000 24GB
Dassault Systèmes SOLIDWORKS Visualize²	Quadro M5000	Quadro M6000 24GB	Multi-GPU 2x Quadro M6000 24GB
Lumiscaphe P3D Design	Quadro M5000	Quadro M6000 24GB	Multi-GPU 2x Quadro M6000 24GB
MathWorks MATLAB	Multi-GPU Quadro K620 + Tesla K40	Multi-GPU Quadro M4000+ Tesla K40	Multi-GPU Quadro M5000 + Tesla K40
MSC Nastran³	Multi-GPU Quadro M2000 + Tesla K40	Multi-GPU Quadro M4000+ Tesla K40	Multi-GPU Quadro M5000 + Tesla K40
PTC Creo	Quadro M2000	Quadro M4000	Quadro M5000
Siemens NX⁴	Multi-GPU Quadro M2000 + Tesla K40	Multi-GPU Quadro M4000 + Tesla K40	Multi-GPU Quadro M5000 + Tesla K40
MODELING / ANIMATION/VISUALIZATION/EFFECTS			
Autodesk 3ds Max	Quadro M2000	Quadro M4000	Quadro M5000
Autodesk 3ds Max for GPU Ray Tracing	Quadro M5000	Multi-GPU 2x Quadro M6000 24GB	Multi-GPU 3x Quadro M6000 24GB
Autodesk Maya®	Quadro M4000	Quadro M5000	Quadro M6000 24GB
Autodesk Maya for GPU Ray Tracing	Quadro M6000 24GB	Multi-GPU 2x Quadro M6000 24GB	Multi-GPU 3x Quadro M6000
Maxon CINEMA 4D	Quadro M2000	Quadro M4000	Quadro M5000
NewTek Lightwave™	Quadro M2000	Quadro M4000	Quadro M5000
Side Effects Houdini	Quadro M6000 24GB	Multi-GPU 2x Quadro M6000 24GB	Multi-GPU 3x Quadro M6000 24GB
Adobe After Effect CC⁵	Quadro M4000	Multi-GPU 2x Quadro M5000	Multi-GPU 2x Quadro K6000
VIDEO EDITING			
Adobe® Premiere Pro® CC	Quadro M2000	Quadro M5000	Multi-GPU 2x Quadro M6000 24GB
Avid® Media Composer®	Quadro M2000	Quadro M4000	Quadro M5000
Grass Valley Edius®	Quadro K620	Quadro M2000	Quadro M4000
Sony Vegas Pro™	Quadro K620	Quadro M2000	Quadro M4000
IMAGE EDITING/ARTISTIC DESIGN			
Adobe® Photoshop® CC	Quadro K620	Quadro M2000	Quadro M4000
Adobe® Illustrator® CC	Quadro K620	Quadro M2000	Quadro M4000
Allegorithmic Substance Designer	Quadro M2000	Quadro M4000	Quadro M6000 24GB
OIL & GAS			
Halliburton (Landmark) DecisionSpace®, GeoProbe®	Quadro M4000	Quadro M5000	Quadro M6000 24GB
Paradigm Geophysical VoxelGeo®	Quadro M5000	Quadro M6000 24GB	Multi-GPU 2x Quadro M6000 24GB
Paradigm Geophysical EarthStudy360®	Quadro M4000	Quadro M5000	Quadro M6000 24GB
Schlumberger Petrel	Quadro M4000	Quadro M5000	Quadro M6000 24GB
IHS KINGDOM	Quadro M2000	Quadro M4000	Quadro M5000

1. Quadro is for Abaqus/CAE and Tesla is for Abaqus/Standard
2. SOLIDWORKS visualize users may require more powerful and/or multiple GPU for improved rendering performance, depending on redering frequency and scene complexity.
3. Quadro is for MSC Patran and Tesla is for MSC Nastran
4. Quadro is for Siemens NX and Tesla is for Siemens Nastran
5. NVIDIA OptiX technology not yet implemented by Adobe in After Effects CC for GPUs based on the latest NVIDIA Maxwell architecture, Quadro GPUs affected are Quadro M6000 24GB and Quadro M2000

BOARD FEATURES	Quadro M6000	Quadro M5000	Quadro M4000	Quadro M2000	Quadro K1200	Quadro K620	Quadro K420
Memory Size	12GB/24GB GDDR5	8GB GDDR5	8GB GDDR5	4GB GDDR5	4GB GDDR5	2GB DDR3	1GB/2GB DDR3
Memory Interface	384-bit	256-bit	256-bit	128-bit	128-bit	128-bit	128-bit
Memory Bandwidth	317 GBps	211 GBps	192 GBps	106 GBps	80 GBps	29 GBps	29 GBps
NVIDIA® CUDA™ Parallel Processor Cores	3072	2048	1664	768	512	384	192
Max Power Consumption	250W	150W	120W	75W	45W	41W	41W
Power Connector	1 x 8-pin	1 x 6-pin	1 x 6-pin				
Number of slots	2	2	1	1	1	1	1
# Simultaneous Displays ²	4	4	4	4	4	4	4
Display Connectors	DVI-I DP x4 3-pin Stereo ¹	DVI-I DP x4 3-pin Stereo ¹	DP x4 3-pin Stereo ¹	DP x4	mDPX4	DVH DP	DVH DP
ECC (Error Correcting Code)	✓ ⁴	✓ ⁴					
OpenGL	4.5 ⁷	4.5 ⁷	4.5 ⁷	4.5 ⁷	4.5 ⁷	4.5 ⁷	4.5 ⁷
Vulkan	1.0 ⁷	1.0 ⁷	1.0 ⁷	1.0 ⁷	1.0 ⁷	1.0 ⁷	1.0 ⁷
Shader Model	5	5	5	5	5	5	5
DirectX	12 ⁹	12 ⁹	12 ⁹	12 ⁸	12 ⁸	12 ⁸	12 ⁸
NVIDIA® Mosaic Technology	✓	✓	✓	✓	✓	✓	✓
Multi-Display Synchronization	Quadro Sync	Quadro Sync	Quadro Sync				
NVIDIA SLI® Support ⁵	✓	✓	✓				
NVIDIA® nView® Desktop Management Technology	✓	✓	✓				
GPUDirect™ for Video ⁶	✓	✓	✓				

1 Optional
2 Includes directly attached displays and displays connected through DisplayPort 1.2 hubs
3 On both GPU Cache and on-board DRAM
4 On on-board DRAM
5 On SLI Certified Platforms
6 Supported via GPUDirect for Video enabled 3rd party I/O boards
7 Product is based on a published Khronos Specification, and is expected to pass the Khronos Conformance Testing Process when available. Current conformance status can be found at www.khronos.org/conformance
8 GPU supports DX 12 API, Hardware Feature Level 11_0
9 GPU supports DX 12 API, Hardware Feature Level 12_1

NVS Desktop Workstation Specifications				
	NVS 315	NVS 310	NVS 510	NVS810
Bus Interface	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16
Memory Size	1024 MB DDR3	512 MB DDR3	2048 MB DDR3	4GB DDR3
Memory Interface	64-bit	64-bit	128-bit	128-bit
Memory Bandwidth	14 GB/s	14 GB/s	28.5 GB/s	28.8 GB/s
Form Factor	SFF ¹	SFF ¹	SFF ¹	ATX
CUDA Processor Cores	48	48	192	1024
Display Connectors	DMS59	DisplayPort (2)	mini DisplayPort (4)	mini Display Port (8)
Max. Displays per Board	2	2	4	8
Max Digital Display Support	2560x1600 (DisplayPort)	2560x1600	3840x2160	8x 4096x2160@30Hz 4x 4096x2160@60Hz
	1920x1200 (DVI-I)			
Max Analog Display Support	2048x1536 (VGA)	1920x1200	1920x1200	1920x1200
OpenGL	4.3	4.3	4.3	4.5
DirectX	11	11	12	12
Shader Model	5	5	5	5
CUDA enabled	Yes	Yes	Yes	Yes
Power & Cooling	19.5W - Active ³	19.5W - Active ³	35W - Active ³	68W-Active ³
nView Enabled	Yes	Yes	Yes	Yes
DisplayPort Links	2 ⁴	2	4	8
DVI Links	2 ⁵	2 ²	4 ²	8 ²
Analog Displays VGA	2 ⁶	2 ⁷	4 ⁷	8 ⁷
DisplayPort 1.2 Support	Yes	Yes	Yes	Yes
Max Displays in DP 1.2 MST mode	2	2	4	8 ⁸
Max Displays in DP 1 2 Stream Cloning mode	8	8	16	32

1 SFF= Small Form Factor (low profile card)
2 Through DisplayPort to DVI-D industry standard cables
3 High reliability, variable speed fansink
4 Using DMS59 to DisplayPort Cable Adaptor
5 Using DMS59 to DVI-I Cable Adaptor
6 Using DMS59 to VGA Cable Adaptors
7 Through DisplayPort to VGA industry standard cables
8 Using two cables, one from each GPU on the NVS 810